REMARKS

Claims 1-12 were in issue. No claims have been canceled. No new matter has been added. Thus, claims 1-12 are presented and at issue.

The §101 Rejection

The Examiner has rejected claims 1-12 under 35 U.S.C. §101 as being directed to non-statutory subject matter. Applicant respectfully traverses this rejection because the claims presented are statutory subject matter as being directed to methods and programs that are applied in a practical manner and which generate a concrete, useful, and tangible result.

The patentability test now asserted by the Examiner is incorrect. The proper test for non-patentability of claims that involve mathematical algorithms is *not* whether such claims express "a mathematical algorithm or idea without a practical application". In *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368 (Fed. Cir. 1998), the Federal Circuit stated that:

> Unpatentable mathematical algorithms are *identifiable* by showing they are *merely abstract ideas constituting disembodied concepts or truths that are not 'useful.' From a practical standpoint, this means that to be patentable an algorithm must be applied in a 'useful' way.* ... [Emphasis added]

These two tests – opposite sides of the same coin – were reinforced by the Federal Circuit in *AT&T v. Excel Communications*, 172 F.3d 1352 (Fed. Cir. 1999):

> [O]ur inquiry here focuses on whether the mathematical algorithm is *applied in a practical manner to produce a useful result.* [Emphasis added]

Thus, the Examiner must identify an unpatentable mathematical algorithm by showing (1) that it is *merely* an abstract idea constituting disembodied concepts or truths that are not *useful,* or (2) that it is not applied in a *practical manner* or does not product a *useful result.*

Here, the Examiner has instead focused on whether the claims recite subject matter that has a *practical application* – which is not the same as whether the claims apply an algorithm in a *practical manner* to produce a useful *result.* It is clear that the Examiner's subjective assertion (with no

supporting facts stated) that the claimed invention (or the algorithmic portion) has no practical application is irrelevant to patentability.

What *is* relevant is that the claimed methods and computer programs (1) are applied in a practical manner – by obtaining information as specified in each claim and applying algorithms to make specified determinations – to the problem of analyzing the capacity of an application executing on a parallel processing system, where the application is expressed as a graph of vertices (or vertices and links, in some claims), and (2) output a useful result (*e.g.*, a description of the total execution time and performance of the system based on the determined execution time and counts of data records, or performance characteristics).

The Examiner dismisses *State Street* and *AT&T v. Excel* by simply asserting that "the practical applications in [*State Street* and *AT&T v. Excel*] do not correlate to applicant's claims and they do not apply." However, the results produced by the invention as claimed are of a type similar to the results in at least *State Street*. The output of the invention in issue in *State Street* was a final share price momentarily fixed for recording and reporting purposes – a number that had practical application *only* by reason of it being useful to humans who read and understood it, such as regulatory authorities or brokers who might use the number in subsequent trades. Here, a variety of results (*e.g.*, a description of the total execution time and performance of the system based on the determined execution time and counts of data records, or performance characteristics) useful to humans (*i.e.*, information about the capacity of an application executing on a parallel processing system) are explicitly recited in the various claims as being output.

In *AT&T v. Excel*, the claim in issue was directed to generating a message record that included a Boolean flag (a "PIC indicator") having a specified value. The Court found that:

> The PIC indicator represents *information* about the call recipient's PIC, a useful, non-abstract result that facilitates differential billing of long-distance calls made by an IXC's subscriber. *Because the claimed process applies the Boolean principle to produce a useful, concrete, tangible result without pre-empting other uses of the mathematical principle, on its face the claimed process comfortably falls within the scope of §101.* [Emphasis added]

Here, algorithms are applied to specific inputs to provide an answer to users of the capacity of an application executing on a parallel processing system and expressed as a graph. In particular, the method of claim 1 outputs a description of the total execution time and performance of the system based on the determined execution time and counts of data records. This result is useful to users interested in knowing before hand how long a particular computation will run. This result is concrete in that it provides a specific, reproducible result to specific inputs. This result is tangible in that it is made available as an output, and is thus not ephemeral or inaccessible.

The useful results of the algorithms set forth in the claims do not pre-empt other uses of the mathematical principles involved in such algorithms. As in *AT&T v. Excel*, on their face the claims in issue comfortably fall within the scope of §101. Accordingly, the invention as now claimed meets the statutory subject matter tests of *State Street* and *AT&T v. Excel*.

The §103 Rejection

The Examiner has rejected claims 1-2 under 35 U.S.C. §103(a) as being obvious over Benner *et al.* ('216) in view of Tsuchida *et al.* ('059). Applicant respectfully traverses this rejection.

Benner teaches a method for more efficiently operating the hardware of a parallel computing system by employing sequenced communications. Benner has no teachings about applications expressed as a graph of vertices, or of vertices and links (the Examiner's citation to FIG. 4 of Benner mischaracterizes Benner's teachings – FIG. 4 is a diagram of a "4 dimension hypercube structure for a parallel computer", not a *graph* as described in the present application). Benner teaches nothing about analyzing the capacity of such an application executing on a parallel processing system. Benner teaches nothing about creating a performance description of each vertex in the graph and determining an execution time for each vertex in the graph (the Examiner's citation to FIG. 3 of Benner mischaracterizes Benner's teachings – FIG. 3 shows "use of overlap communications" to carefully order reads and writes of memory locations; see col. 8, lines 12-35). Thus, Benner is not even applicable art, let alone art that suggests features of the invention as claimed.

While Tsuchida does suggest that the processing time of each processing node does vary with the "number" (amount) of data being processed, that is neither surprising nor relevant. Tsuchida not only has no teaching about applications expressed as a graph of vertices, or of vertices and links, Tsuchida has no teaching about any method or system for analyzing the capacity of such an application executing on a parallel processing system. Thus, Tsuchida is not even applicable art, let alone art that suggests features invention as claimed.

Even in combination, Benner and Tsuchida fail to teach or suggest the invention as claimed. One of ordinary skill in the art, fairly reading Benner and Tsuchida, would have no idea how to analyze the capacity of an application executing on a parallel processing system, where the application is expressed as a graph of vertices or of vertices and links.

Indication of Allowability

The Examiner has indicated that claims 3-12 would be allowable "if rewritten or amended to overcome the rejections(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action". Applicant asks that the Examiner clarify the status of these claims, since no 112, 2nd paragraph rejection is stated in the present Office action.

Applicant submits that this case is now in condition for allowance. Therefore, Applicant respectfully requests reconsideration and reexamination of the present application and allowance of the case at an early date.
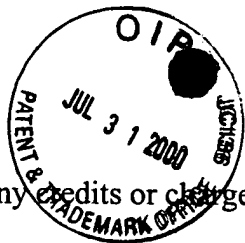
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Respectfully submitted,

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